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SCIENCE NEWS LETTER

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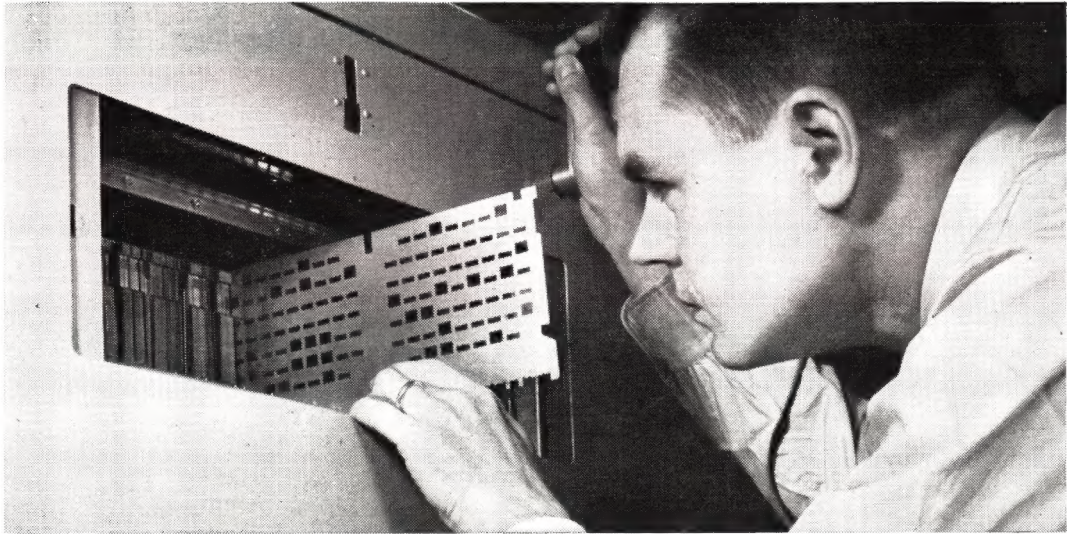
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Jets Aloft

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A SCIENCE SERVICE PUBLICATION



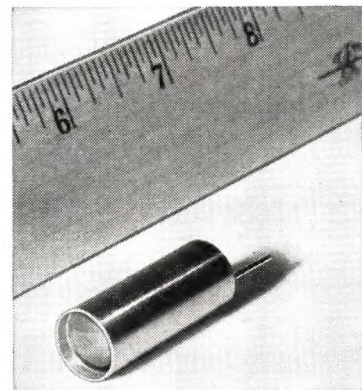
Checking perforated metal card in Bell's new "card file." If the first voice-way is in use, a "detour" is swiftly found.

CARDS FOR CONVERSATION

To find out how to route Long Distance calls a dial system needs lots of information—fast. To provide it Bell Laboratories engineers developed a new kind of card file—one that dial systems can read.

Punched holes on metal cards tell how calls should be handled. When a call arrives the appropriate instruction card is displaced so that its pattern of holes is projected by light beams on a bank of Phototransistors, which signal switches to set up the best connection.

The "card file" will have its widest use in speeding Long Distance calls that are now dialed by a telephone operator and may one day be dialed by you personally. It is another example of how Bell Telephone Laboratories helps telephony to grow, as costs are kept down.



New Phototransistor unit. Light entering cylinder is focused by lens on germanium that responds by generating current. Like the Transistor, the Phototransistor was invented in Bell Telephone Laboratories.



BELL TELEPHONE LABORATORIES

IMPROVING TELEPHONE SERVICE FOR AMERICA PROVIDES
CAREERS FOR CREATIVE MEN IN SCIENTIFIC AND TECHNICAL FIELDS

MEDICINE

Six New Antibiotics

Half a dozen antibiotics, mostly still in the laboratory stage, are reported to symposium. One of the antibiotics, Puromycin, has successfully reduced tumor weight in mice.

► HALF A dozen new antibiotics for fighting infectious diseases and one anti-tumor antibiotic were reported at a symposium held in Washington under the sponsorship of the Food and Drug Administration of the U. S. Department of Health, Education and Welfare.

The six new ones are Tetracycline, Hygromycin, Streptogramin, Ruticin, Streptocardin and Methymycin.

The potential anti-tumor antibiotic is Puromycin. Its effect on experimental tumors was reported. It is one of a number of antibiotics being tested for anti-tumor activity in experimental animals by William Troy and associates of Lederle Laboratories, Pearl River, N. Y.

In mice given the largest dose they could stand, this antibiotic reduced the weights of breast cancers up to 70%. Its action against other cancers in mice and rats was relatively weak.

Tetracycline, trademarked Achromycin by its producers, Lederle Laboratories, was made from an older antibiotic, Aureomycin. By a chemical process a chlorine atom was removed from Aureomycin and replaced by a hydrogen atom. This change, although seemingly minor to a layman, took years to accomplish and results in a completely new antibiotic.

Dr. Raymond W. Cunningham of Lederle explained that in literally thousands of laboratory tests on mice, rats and dogs, Achromycin showed a low toxicity. The yellow-colored antibiotic is both more soluble and more stable than Aureomycin in an alkaline solution. Antibiotics are mixed in an alkaline solution for vein injections.

Dr. J. S. Kiser of the Pearl River group said the antibiotic is effective against organisms that cause such diseases as pneumonia, dysentery, typhoid fever, etc. Dr. Maxwell Finland of Harvard Medical School reported that, in clinical trials, the new antibiotic's effects closely paralleled those of Aureomycin, and that Achromycin had even fewer side effects than the older drug.

Hygromycin not only stops bacteria but can kill them, and in animal tests was effective against tuberculosis, Dr. R. C. Pittenger and associates from Lilly Research Laboratories, Indianapolis, reported.

Streptogramin, Ruticin and Streptocardin were developed by researchers at Sharp and Dohme division of Merck and Company, West Point, Pa. Methymycin was reported by scientists from the Squibb Institute for Medical Research, New Brunswick, N. J. These are still in the laboratory testing stage.

Dramatic results in the prevention of rheumatic fever and the treatment of otitis

media, an infection of the middle ear, were reported for a recently introduced long-acting penicillin called Bicillin.

Lts. Robert Chamovitz, Medical Corps, U. S. Air Force, and Francis J. Catanzaro, Medical Corps, U. S. Army, Warren Air Force Base, Wyoming, reported results of a study made with 241 test patients suffering from pharyngitis. A group of 132 was given Bicillin, while the other 109 were treated with other drugs.

Of those receiving Bicillin, only one showed traces of beta hemolytic streptococci in the throat, while 84.8% of those given standard treatment carried the germs.

Although the cause of rheumatic fever is not known, it has been found to follow beta hemolytic streptococcal infection. A single injection of Bicillin, setting up a two-week barrier against that infection, has proved effective in preventing the more serious disease.

Two cases of rheumatic fever developed in the Ft. Warren control group, whereas there were none among the patients who received Bicillin.

Dr. Gene H. Stollerman, medical director of Irvington House, Irvington-on-Hudson, N. Y., reported similar results with Bicillin. The antibiotic is valuable in pre-

venting recurrences of rheumatic fever, which in time usually leads to rheumatic heart disease, he reported.

Dr. Stuart Walker of Johns Hopkins Hospital, Baltimore, reported very favorable results with Bicillin in the ear infection.

Earlier in the year, the same drug was reported to be effective as a one-shot cure of syphilis by venereal disease specialists of the U. S. Public Health Service. Bicillin was developed at the Wyeth Institute of Applied Biochemistry, Philadelphia.

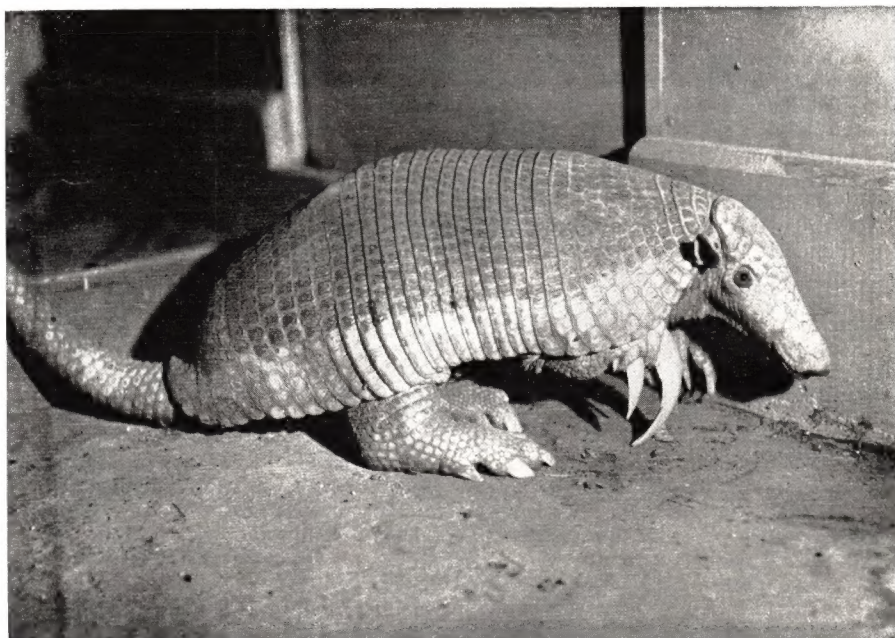
While these new antibiotics, or so-called mold remedies, held the spotlight, results with some of the older ones, best methods of using them and ways of avoiding their disadvantages such as sensitivity of the patient and resistance of the germs were described.

"Ten years ago penicillin was the only antibiotic known to medical practice, and its use was confined to battlefield casualties," Dr. Henry Welch, chief of the Food and Drug Administration's antibiotic division, pointed out.

"There was none available for civilian patients. Today there are numerous antibiotics, accounting for more than one-half of all prescriptions written in this country.

"The past ten years may well go down in medical history as the 'Antibiotic Era,' based upon what these drugs have done to minimize human suffering and extend the life span.

"Primary syphilis has been markedly reduced throughout the United States, to the point where it has become very difficult to find cases for clinical study. Marked progress is being made in the eradication of spirochetal diseases in tropical countries where these diseases are endemic. Mass



GIANT ARMADILLO—A recent arrival at the National Zoological Park in Washington is this giant armadillo, *Priodontes giganteus*. It usually measures more than four feet from head to the end of its tail, and is found in South America from the Guianas to Argentina.

therapy measures under the auspices of the WHO should eventually wipe them out.

"The fatality rate for pneumococcal pneumonia has been cut to an all-time low of less than 5%. Prior to the introduction of serums it ran from 20% to 30%. The serums cut it to 15%, the sulfonamides to around 10%, and penicillin to less than 5%.

"Subacute bacterial endocarditis was practically 100% fatal before antibiotics, but today over 50% are saved.

"Operations for acute mastoiditis are almost a thing of the past. A few dollars' worth of antibiotic usually prevents or cures these troublesome infections.

"These are only a few outstanding examples of the contributions to health made by the antibiotic drugs. Today we are seeing the development of an important economic contribution through the use of antibiotics for promoting healthy, rapid growth of swine and poultry. In the feeding of chickens the time from hatching to marketing may be cut as much as four weeks by use of antibiotic-treated feedstuffs. This saving is increased by reduction of losses from disease as well as more rapid growth, savings in feed, and more rapid marketing.

"It would be unrealistic to say that the antibiotics have not also brought their problems.

"The answers to these problems lie in continued research by competent investigators and in the proper use of these drugs under supervision of the medical profession."

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MEDICINE

Frozen Sperm Pregnancies

► THREE WOMEN are pregnant by artificial insemination with frozen human spermatozoa in what is believed to be the first successful clinical application to human beings of the method used widely in animal breeding.

Drs. R. G. Bunge and J. K. Sherman of the department of urology of the State University of Iowa Medical School report in *Nature* (Oct. 24) that three women have been successfully inseminated with frozen semen. At the time the report was made, they were approximately six, five and three months pregnant.

General clinical application of use of frozen semen "must wait until normal embryonic development has been observed and the progeny are declared normal."

As long ago as 1866 an Italian scientist, Dr. P. Montegazza, observed the survival of human spermatozoa after exposure to temperature of 15 degrees below zero Centigrade (5 degrees Fahrenheit).

The Italian scientist even then speculated that in the future frozen semen might be used in animal husbandry, which is now the case. He also proposed that a man dying on the battlefield might, by his wife, beget a legitimate child after his own death.

Later work in England showing that glycerol protected frozen human spermato-

zoa and increased survival encouraged the Iowa scientists to conduct experiments. When their work indicated that treatment with 10% glycerol prior to freezing with dry ice produced an average 67% survival in human spermatozoa obtained from five young healthy men, they began clinical tests with the cooperation of Drs. W. C. Keettel and J. T. Bradbury of Iowa's department of obstetrics and gynecology.

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MEDICINE

Sulfa Drugs for Children

► IN SPITE of all the antibiotics or so-called mold remedies available today and being developed for use tomorrow, the sulfa drugs still hold top priority for treatment of infections in children, Dr. Sidney Ross of Children's Hospital, Washington, declared at the same symposium on antibiotics.

The sulfas, Dr. Ross pointed out, check the infections, they are inexpensive and they are easy to give.

They are definitely the drug of choice for treating meningococcus infections. In the ear infection, otitis media, which bulks very large among children, a sulfa drug and penicillin may be given, he said.

Sudden deaths following use of antibiotic drugs may number several hundred, Dr. Ethan Allen Brown of Boston declared at the symposium. He and Dr. Perrin H. Long of the State University of New York pointed out that many of these deaths go unreported in medical literature.

Most such deaths, Dr. Long said, have followed the use of penicillin, with a few following use of streptomycin. He has not heard of any reports of these deaths after use of the other antibiotics. Dr. Brown, however, said that it may be too early after developments of the newer antibiotics for such reactions to have occurred.

These sudden deaths are the kind due to anaphylactic shock from unusual sensitivity to foreign material. The sensitivity is different from the kind that causes skin rashes.

The deaths can be prevented, Dr. Long said, if the doctor, before giving an antibiotic, finds out whether the patient has had a reaction to a previous dose of antibiotic, whether he has asthma or some other allergy, and whether he has had procaine before. This last is because penicillin is often given in the form of procaine penicillin. If the answer is yes to any of these conditions, the antibiotic should not be given.

Besides making the usual safety tests of new antibiotics, manufacturers should, Dr. Brown advised, run tests on animals to see whether repeated small doses over long periods will induce allergic reactions.

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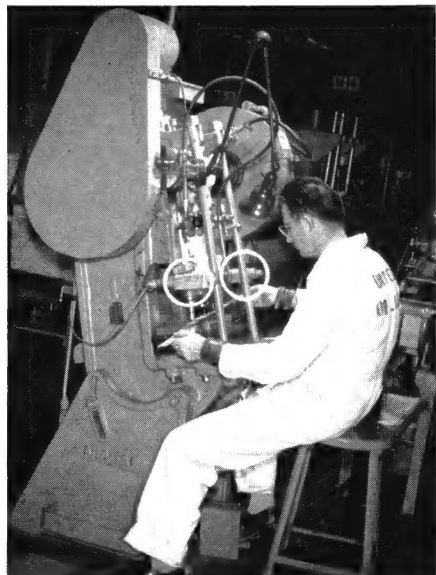
Ascorbic acid is used to prevent the darkening of peaches when they are frozen or canned.

A sugar-bearing ration for weaning pigs has been created; when fed to the animals it produces greater pork yields at lower cost.

ASTRONOMY

Astronomical Highlights

Top astronomical events of 1953 included discussions concerning a possible national observatory, and three developments each in radio and photoelectric astronomy.



ATOMIC AGE SAFETY—A mechanic at the maintenance base of United Air Lines in San Francisco operates a punch press, wearing radioactive wristbands to protect his hands from possible injury. Should his hands enter the danger zone, Geiger tubes (circled) pick up radiation from wristband and stop the machine.

GENERAL SCIENCE

Bureau of Reclamation Cuts Research Programs

► **RESEARCH PROGRAMS** relating to materials or products that can be bought from private manufacturers will be dropped by the U. S. Bureau of Reclamation.

Commissioner of Reclamation W. A. Drexler has announced that the bureau will follow the recommendation of a survey team that "it does not seem wise for the bureau to attempt to compete" with private manufacturers.

The reorganization was ordered by Secretary of the Interior Douglas McKay, following the report of the survey group which has spent two months studying the reclamation work.

The survey report hit hard at research involving paints and herbicides where the Bureau of Reclamation laboratory has developed composition specifications for manufacturers. In the future, performance specifications will be used and standard products will be included.

Most of the bureau's activities are in the West, where it builds dams, plans for the management of river basins, and attempts to control and manage the water supply.

Research concerning hydraulics and the physical and chemical characteristics of earth and rocks under varying conditions of load, hydraulic flow and exposure will be continued.

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► **ELEVEN TOP** astronomical highlights of the past year, picked by Dr. Harlow Shapley of Harvard College Observatory, are:

1. A conference this past summer of photoelectric astronomers at the Lowell Observatory, meeting under the auspices of the National Science Foundation, during which definite progress was made in discussions of the advisability of establishing, in the near future, a cooperatively-operated research observatory at the best possible site, probably in the Southwest. It would give special reference to the immediate requirements of photoelectric programs and be available also for possible expansion for general astronomical research.

2. Starting construction of the world's greatest "inch" for telescopic observation—the 3,000-inch steerable radio telescope at Jodrell Bank near Manchester, England, where epochal work will be continued on nearby meteors and remote radio stars. Dr. A. C. B. Lovell of the University of Manchester reports that the giant instrument will seek to penetrate the dust clouds, found in the Milky Way's rift, in order to reveal what stellar wonders lie beyond it.

3. The design and preliminary testing by Dr. Andre Lallemand and his associates of the Observatory of Paris, France, of a device for "electric photography," which holds promise of speeding up greatly the recording of faint stellar objects.

4. Attainment for the first time of stars of magnitude 23 on the photographic scale with the 200-inch giant Hale reflecting telescope on Mt. Palomar. Dr. W. A. Baum of Mount Wilson and Palomar Observatories achieved this by making use of new, photon-counting devices in photoelectric photometers.

5. As an important step in the analysis of the structure of galaxies, the exploration by radio of the Magellanic Clouds by Drs. Frank Kerr and J. V. Hindman of the Radiophysics Laboratory, Sydney, Australia, using for the first time the rapidly developing tool of the 21-centimeter radiation emitted by neutral hydrogen atoms in interstellar clouds. They found the volumes of the Clouds are larger and their motions more turbulent than those recorded on photographic plates.

6. Further developments in the revision of the extra-galactic distance scale, first reported as a highlight last year. The new work includes contributions by Dr. Walter Baade and associates at Mt. Wilson and Palomar Observatories; Dr. Gerald E. Kron of Lick Observatory and Dr. S. C. B. Gas-

coigne of Australia's Commonwealth Observatory, while working in Australia; Dr. A. D. Thackeray of Radcliffe Observatory, Pretoria, South Africa; Dr. Harold Weaver of the University of California; and Mrs. Virginia McK. Nail and Dr. Harlow Shapley of Harvard College Observatory, who find, from a study of the brightest stars in the Magellanic globular clusters, that the previous distances to galaxies beyond our own should be multiplied by 2.2.

7. The measurement photoelectrically and the analysis at the McDonald Observatory, Tex., by Drs. Gerard P. Kuiper, Daniel L. Harris III and I. I. Ahmad of Yerkes Observatory of the light variations of ten asteroids. Their studies confirm the belief that most asteroids are irregular rotating fragments, with the reflected light of the sun varying with the asteroid's rotation, but without changing in color.

8. Studies of the night sky by Dr. Franklin E. Roach of the Naval Ordnance Test Station, Inyokern, Calif., in which he demonstrates the connection of the corona and the zodiacal light.

9. Pioneer theoretical work by Dr. G. C. McVittie of the University of Illinois on the application of certain Einstein relativity equations to gas dynamics, with potential usefulness in the study of interstellar material and phenomena associated with novae.

10. The detection by a research group from the Naval Research Laboratory, working at White Sands, N. Mex., of the ultraviolet Lyman alpha line of hydrogen, with a wavelength of 1216 Angstrom units, in the solar spectrum. Their observation, made by using rocket-borne photon counters shot above the ozone blanket to a height of some 50 miles, has been confirmed by Dr. William A. Rense and associates at the University of Colorado, also through the use of high-altitude rocketry.

11. The observation by Drs. K. E. Machin and F. G. Smith of the Cavendish Laboratory, Cambridge, England, of the occultation of the strong radio source in the Crab Nebula by the outlying parts of the solar corona when the nebula is still at a distance from the sun of as much as ten times the sun's apparent radius. This is far beyond the coronal streamers that can be recorded photographically.

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A British experimental plane with a flexible wing structure, called an isoclinic wing, is expected to have a "tremendous impact" upon the wing shapes of future high-flying airplanes.

METEOROLOGY

Will Hamper Forecasts

Withdrawal of U. S. ships from weather reporting network in Atlantic will hamper long-range forecasts. Weather data from them has been used to predict flying conditions.

► THE WITHDRAWAL of U. S. Coast Guard cutters from the chain of North Atlantic weather observation stations will seriously hamper the long-range forecasting efforts of meteorologists.

In announcing withdrawal from the chain as of June 30, the U. S. representative at International Civil Aviation Organization at Montreal gave as the reason that benefits from the program, set up in 1946, "are no longer commensurate with the cost." Cooperating with the United States in maintaining the chain are Britain, Norway, France and the Netherlands.

The weather data have been used by meteorologists to make forecasts for planes flying across the North Atlantic. An even more important use of the data obtained by the weather chain ships is in the development of long-range five- and 30-day forecasts.

While it is partially true that weather moves from west to east, making the North Atlantic information of great use to European weathermen, it is also true that weather over the Atlantic may "block" a developing weather system and force it back over the United States.

A case in which this happened is the New England hurricane of 1938. The hur-

ricane was blocked in its general movement eastward out to sea and struck the mainland with terrible force.

Meteorologists have been trying to develop means of taking data from points all over the globe and drawing up a weather map covering the conditions over an entire hemisphere. With this as a basis, long-range forecasts for trans-ocean flying can be made.

Six weather station ships in another international effort are now being maintained in the Pacific, and the information obtained by them is being used in long-range forecasts. It is presently believed that the government will not cut this service.

The United States estimated the costs of maintaining each of its 15 cutters in the area at \$1,000,000. The total costs of the ocean station program is \$17,500,000. In addition to the contributions of ships, money payments are made to the program by Belgium, Denmark, Iceland, Ireland, Mexico, Portugal, Spain, Sweden and Switzerland. Their payments are distributed among the countries contributing more than their share of ships.

Many experts foresee that, without U. S. ships, the network will be disbanded.

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GENERAL SCIENCE

New Engineering Outlook

► THE SCIENTIFIC Manpower Commission has urged parents and teachers to take a new outlook toward science and engineering to attract more of the nation's youth into technical circles.

The positive aspects of engineering so greatly outweigh the negative angles that adults may be doing their children a disservice by emphasizing such things as "hard math," Dr. Howard A. Meyerhoff, president of the Commission, told SCIENCE SERVICE.

Children with a bent toward science will have little trouble with their mathematics, he said, although their parents may have failed high school algebra.

Emphasis should be put upon the fascinating array of scientific fields, the great chances for advancement, the almost unlimited opportunities to serve America, the well-paying positions and the security offered by technical professions.

Furthermore, Dr. Meyerhoff pointed out, it is not true that Junior must bury his nose in a test tube to become a scientist. He may not have a flair for research. There is a job for every youngster who likes

science. If he is not interested in research, he still has the vast and intriguing fields of development, production, operation and maintenance to enter.

Dr. Meyerhoff listed the following as "indexes" to the child's interest in science:

1. When Junior or Susie put something together again after they have taken it apart.
2. When they read popularly written science and mechanical magazines, or when they choose books dealing with such things as airplanes, motors, butterflies, primitive peoples, medicine and expeditions.

3. When their report cards show creditable work in mathematics. A's are not necessary here. Arithmetic in grade school is quite different in principle from the engineer's differential equations. Persons who struggled desperately to pass percentages in the seventh grade have made A-pluses in college calculus.

Parents who spot any or all of these characteristics in their children should quietly encourage—but not force—their children to continue exploring science.

The child can be urged to join a Boy or

Girl Scout troupe to learn more about nature. He can be given subscriptions to magazines which include scientific articles of interest to him. He can be given inexpensive scientific instruments as presents.

Teachers have an even greater opportunity to influence children, Dr. Meyerhoff believes. The teacher is in a better position to discover the particular mental ability of the child, and to place in the child's path the things most likely to stimulate him to seek the best job of which he is capable.

However, teachers can exert a bad influence as well as a good one, Dr. Meyerhoff warned. Many teachers are "scared as all heck" of scientific subjects. Their own fear often spills over unintentionally to the child.

The future of the entire country depends upon the youth now in grade and high schools, Dr. Meyerhoff said. These boys and girls tomorrow will have to hasten the pace of American technology to maintain U. S. world leadership.

"When you come right down to it," Dr. Meyerhoff went on, "the survival of this nation rests upon our technology, and this hinges on the adequacy of our technically trained men and women."

"There is a tremendous trust in the hands of American parents and teachers today," he said. "We cannot afford to mishandle it."

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GENERAL SCIENCE

Senator Wiley Asks Aid For Inventors' Council

► FEDERAL AID for the National Inventors Council has been called for by Sen. Alexander Wiley (R-Wis.), chairman of the Senate Foreign Relations Committee.

Sen. Wiley told the Veterans of Foreign Wars that the National Inventors Council, which screens ideas having possible military value, needs more funds and a larger staff.

At present, he said, the thousands of ideas pouring into the Council are being evaluated by merely one junior engineer.

"This," he went on, "is an utterly fantastic situation for the greatest country in the world—thousands of ideas pouring in, one engineer to sift them."

"It is absurd in a country relying so heavily upon inventive progress and constant technological improvement."

The Senator said that the inventive genius of science and engineering, of military men and civilians, has not been sufficiently tapped here and abroad. He pointed out that many great advances in military equipment have been contributed by civilians.

Specifically he cited the Colt revolver, the Garand rifle, the Whitehead torpedo, Vieilles' smokeless powder and the Erickson revolving turret warship.

New ideas are needed to fortify America against aggression. Aviation experts predict America's defensive potential could stop only 10% of an aerial attack under ideal conditions. This would be no deterrent at all, he pointed out.

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PLASTIC PIPE—Used in a pipeline more than nine miles long near Poplar, Mont., one length of plastic pipe, held here by 14-year-old Richard Thomas, weighs only 13 pounds as compared to a comparable length of steel pipe, which would weigh 153 pounds.

MEDICINE

Asthma and Allergies

➤ A BETTER deal for the nation's six to seven million asthma and allergy sufferers can be expected from the formation of a new organization, the American Foundation for Allergic Diseases, in New York.

This is a national, voluntarily supported, non-profit foundation organized by the American Academy of Allergy and the American College of Allergists.

Officers of the new organization are: Dr. Horace S. Baldwin, New York, president; Dr. J. Warrick Thomas, Richmond, Va., vice president; Dr. Bret Ratner, New York, secretary, and Dr. Theodore L. Squier, Milwaukee, Wis., treasurer.

By terms of its charter, the foundation is to promote through public education an accurate understanding of the problems of allergic disease; to inform and educate the medical profession in the problems of allergy; to cooperate with medical institutions, hospitals and other organizations in the development of facilities for the treatment and prevention of allergic diseases; and to finance facilities for research in the field of allergic diseases, including fellowships and residences.

Pointing to the need for the foundation, Dr. Baldwin said that asthma alone is a leading factor in over 10,000 deaths in the United States each year, yet it is difficult for the average asthma patient of moderate means to get adequate treatment.

"It is common experience that most gen-

eral hospitals will not accept such patients because of the prolonged period of intensive medical and nursing care required. Hospitals treating acute diseases are reluctant to admit asthma patients because of the chronicity and the probable long-term stay, and the institutions for chronic care are poorly equipped to treat asthma. There is also a deficiency in the number of allergy clinics.

"Organized research on any sizable scale is likewise lacking. Some promising discoveries have been made recently in the mechanisms and therapy of allergic diseases, but these are often the accomplishment of individual workers and practitioners, operating in their spare time and with limited facilities," Dr. Baldwin said.

"Trained investigators, who can give full time," Dr. Baldwin said, "are being attracted into other fields. Furthermore, the research that is being done under present conditions is frequently duplicated in several clinics and laboratories at the same time, resulting in inefficient efforts and wasted opportunities.

"The teaching of allergy in the medical schools is haphazard and inadequate. In some medical schools, allergy is neglected entirely. Due to the lack of hospital and clinic services, interns and residents have few opportunities for observation of patients. As a result there is a dearth of well trained young specialists."

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BIOCHEMISTRY

Blood Expander Tool To Study Mold Remedies

➤ A NEW tool for testing antibiotics, the so-called mold remedies, has apparently been found in one form of the blood plasma expander, dextran.

Studies suggesting this are reported by Drs. M. Shilo, D. Feingold and Shlomo Hestrin of Hadassah Medical School, Jerusalem, in *Nature* (Oct. 24).

The form of dextran and another polysaccharide, levan, they studied is not the same as the form of dextran used as a plasma expander or substitute. Dr. Shilo and associates worked with "native" dextran and levan, which have entirely different molecular weights from the dextran given to patients in shock if plasma is not available.

The native dextran, they find, can promote germ infection in mice. In this it is like mucin from hogs' stomachs. If the native dextran is injected into the vein of a mouse and germs of an intestinal infection injected into the mouse's belly, the infection is strongly promoted, with more than 70% of mice dying compared to less than 5% dying from the same germs without the native dextran injection.

Since the native dextran injected into a vein can promote infection elsewhere in the body than the blood stream, the infection develops where its responses to an antibiotic can be readily tested, Dr. Shilo and associates suggest.

They think the infection-promoting action of the native dextran and levan results because they modify the inflammatory process rather than because they suppress the germ-engulfing activity of the white blood cells.

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NUTRITION

Grandma's Diet Affects Third Generation

➤ GRANDMOTHER'S DIET affects not only her own offspring but the survival of her offspring's young.

Discovery of this third generation effect of diet, which holds for laboratory rats at least, is announced by Dr. M. O. Schultze of the University of Minnesota in a report to the *Journal of Nutrition*.

At the same time Dr. Schultze reports discovery of what may be a new vitamin, called a lactation factor. This substance exists in a protein preparation from defatted brain and spinal cord and is not the same as any of the known vitamins. It cured failure of milk for the young in rats on diets containing purified soybean proteins.

This same purified diet was the one which showed the third generation effect. If grandmother rats were on this diet, their daughters could not produce milk for the young and there was a high mortality among the grandchildren.

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SURGERY

Operation for Backache Brings Relief of Pain

➤ A NEW operation for backache has brought complete relief of pain for more than three years in two patients and for shorter periods in five more operated on more recently. Dr. Robert Dean Woolsey of Saint Louis University School of Medicine, St. Louis, Mo., reported at the meeting of the Southern Medical Association in Atlanta, Ga.

The operation is for spondylolisthesis, a condition in which the fifth lumbar vertebra is displaced over the first sacral vertebra in the advanced stages.

Dr. Woolsey explained that the severe back pain has been attributed to normal pull on the articulating facets of the fifth lumbar lamina (the part covering the spinal canal) with the first sacral segment, and the sciatic pain has customarily been attributed to compression of nerve roots or to concomitant intervertebral disc lesions of the fifth lumbar vertebra and the first sacral vertebra.

In the past, many surgeons believed that spinal fusions were essential in the correction of spondylolisthesis, but of the seven cited by Dr. Woolsey, ranging in age from 15 to 69, only one had a spinal fusion.

He explained that the operations were done too recently for conclusive proof of permanent cure, but that none has experienced pain and that the first two, a 69-year-old woman and a 38-year-old man have had complete relief of pain and symptoms since their operations more than three years ago.

The surgical procedure recommended involved removal of the fifth lumbar lamina, spine, inferior articulating facets and complete decompression of the fifth lumbar nerve root and first sacral nerve root.

He emphasized the necessity of complete and accurate diagnosis, recalling one of the cases was almost discounted as a neurotic when X-rays failed to show a ruptured intervertebral disc. He said that the physical findings depend largely on the degree of the spondylolisthesis.

Science News Letter, November 7, 1953

NUTRITION

Ready-to-Serve Meals Cost a Third More

➤ IT TAKES the homemaker one-fourth the time but costs over a third more money when she feeds her family from ready-to-serve foods instead of all home-prepared foods.

These results from a test by home economists of the U.S. Department of Agriculture were reported at the Department's Outlook Conference in Washington.

Ready-to-serve foods in the test included, for example, frozen beef pie, canned berries, and butterscotch-nut pudding from a mix requiring no cooking. Tested also, for com-

parison with these and with homemade beef pie, fresh berries and homemade butterscotch-nut pudding, were frozen berries, beef pie from canned meat and a pastry mix, and the pudding made from a mix requiring cooking. This was classed as partially prepared food.

The test was made by two trained home economists, one working in the laboratory and one in her own home kitchen. Meals for a family of four, including two children, for two days were prepared from foods available in supermarkets in the District of Columbia last July. Time included that for preparation of food; washing, drying and storing utensils and equipment used in preparation; setting table and serving the meals, but not washing dishes, silver or glassware or cleaning kitchen after meals.

For one day, home-prepared meals cost \$4.90, took 5.5 hours to prepare. Partially prepared meals cost \$5.80, took 3.1 hours to prepare. Ready-to-serve meals cost \$6.70, took 1.6 hours to prepare.

Science News Letter, November 7, 1953

TECHNOLOGY

Plastic "Cans" Protect Bananas in Shipment

➤ SOUTH AMERICAN bananas now are being "canned on the stem" for shipment in a transparent plastic film one-thousandth of an inch thick.

Fruit producers and shippers alike have found that the protective wrapping preserves the lusciousness of the freshly harvested fruit. By holding in the fruit's moisture, the Bakelite polyethylene film delivers the bananas to the consumer less dehydrated than those that are unprotected. The bananas also can be ripened to a brighter yellow.

Science News Letter, November 7, 1953

VETERINARY SCIENCE

Fall Weather Brings Pig Flu Conditions

➤ THE SUDDEN weather changes associated with early autumn are ideal conditions for swine influenza outbreaks if special precautions are not taken.

The American Veterinary Medical Association warns all swine raisers to watch for signs of coughing or "thumpy breathing" in their pigs. Treatment of the disease is most effective if it can be started early.

Good housing for the animals, particularly draft-free quarters, are recommended to help prevent outbreaks.

Since the virus causing the disease is carried by earthworms, swine raisers should keep their pigs away from strawstacks where large numbers of earthworms can usually be found.

Though seldom fatal, swine influenza is a "profit-robbing" since it sets weight gains back and reduces the resistance of pigs to other diseases.

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IN SCIENCE

VOLCANOLOGY

Krakatoa Active Again, Explodes Frequently

➤ KRAKATOA, FAMOUS East Indian volcano reported erupting again, has been exploding on and off since 1926, Dr. E. G. Zies of Carnegie Institution's Geophysical Laboratory in Washington stated, so it is "not surprising" that it should act up again.

The cinder cone built by previous eruptions has been cut down to the water level several times in the last 30 years, Dr. Zies said, and probably enough new lava has now been built up to form the cone again. Because there is probably not enough material, however, the present eruptions are not expected to be as violent as the one in 1883, the tidal waves from which killed at least 36,000 people. That outburst threw so many tons of dust into the air that red sunsets were seen around the world for two or three years afterwards.

There are about 450 active volcanoes in the world today, and any one of them might perform destructively. By keeping a constant watch on some volcanoes, such as Vesuvius, Kilauea in Hawaii or Krakatoa, geologists have learned to spot some of the danger signs that help to warn of impending eruptions. For Krakatoa, one sign is a roiling up of the water once occupied by the central portion of the volcano. Scientists at the Bandung Volcanological Station on Java usually visit the volcano every month or so on inspection trips.

To geologists, volcanoes are surface phenomena, even though they do erupt with tremendous violence. The origin of their heat and energy is at most 25 to 30 miles below the surface of the earth. If the modern superlative for big explosions is the hydrogen bomb, the volcano is a super-superlative. Volcanic explosions, such as Krakatoa or Katmai in Alaska, Santa Maria in Guatemala, Coseguini in Nicaragua and Pelee in Martinique, let loose far more energy than any bomb man has yet set off.

Science News Letter, November 7, 1953

Jet-Made Vapor Trails Form Large Sky Pattern

See Front Cover

➤ IN THE largest formation of jet fighters believed ever to have been assembled, more than 100 North American F-86 Sabre Jets passed in review at Nellis Air Force Base, Nev., for the outgoing post commander.

The mammoth sky pattern made by some of these jets and their vapor trails is shown on the cover of this week's SCIENCE NEWS LETTER.

Science News Letter, November 7, 1953

E FIELDS

MEDICINE

Advise Iron Shots for Anemia in Arthritis

► INJECTIONS OF iron into the veins is "always worth trying" in rheumatoid arthritis patients who are anemic, with two exceptions, Dr. M. R. Jeffrey of the Rheumatism Research Unit of the South-west and Oxford Region, Bath, England, declares in the *British Medical Journal* (Oct. 24).

The two exceptions are severe constitutional disturbance and prospective surgical operation. In these situations, a rapid rise in hemoglobin is wanted and blood transfusion would give this.

Some patients with the anemia that often comes with rheumatoid arthritis do not benefit from iron injections. This was the case in about one-fourth of the patients he studied. Women were helped more often than men.

Dr. Jeffrey tried to find some test for determining which patients would be helped by the iron shots. Because he could not find any satisfactory test for predicting which patients will be helped, he advises always trying the iron shots.

Science News Letter, November 7, 1953

PUBLIC HEALTH

'Flu-Free Winter Seen Coming Up

► PROSPECTS SEEM good now for a winter without an epidemic of influenza. In fact, one health authority is betting that we will not have any 'flu epidemic this year.

His bet is based on the way the two main types of influenza repeat themselves. Influenza A usually does not repeat oftener than every two to three years. We had an epidemic of influenza A last year, so that type is unlikely to trouble us this coming winter.

Influenza B repeats every four to six years. The last epidemic of that type of 'flu was only two years ago. That seems to mark off any epidemic of influenza B this coming winter.

Predictions of epidemics of disease, particularly influenza which travels so fast, are always hazardous. Health authorities rarely will make them officially, but in shop talk among themselves they make what could be called educated guesses which often hit the mark.

Influenza is no longer a reportable disease in the United States. That is, state health officers no longer send weekly reports on it to the Public Health Service here, though they do report any unusual number of cases occurring in their respective states.

The Influenza Information Center at the National Institutes of Health, Bethesda, Md., and the National Office of Vital Statistics in Washington get reports from various quarters on the prevalence or non-prevalence of the disease.

Their latest report includes one from the Surgeon General of the Army stating that since the latter part of August there has been a slight increase in influenza-like illness among Army personnel in the Far East. In Okinawa two cases occurred in the middle of September which showed signs of being influenza A.

Type B influenza has been prevalent in the State of Western Australia, Australia, but has waned in Melbourne, according to reports received by World Health Organization headquarters at Geneva.

Science News Letter, November 7, 1953

GENETICS

Shetland Pony Type Interests Scientists

► SILVER-DAPPLED SHETLAND ponies excite not only the delight of pony breeders and owners but also the interest of scientists studying genetics, the science of heredity.

Dr. W. E. Castle of the University of California, Berkeley, and Dr. Frank H. Smith of the University of Michigan report that all ponies of this distinctive color may be traced back to Trot 31, a mare born in 1886 whose unusual and striking markings were doubtless due to a mutation.

Mutation is the name given by geneticists to the sudden appearance of a completely new characteristic in an animal. It involves a change in the genes and chromosomes—the basic elements of heredity.

The silver dappled pony has a body the color of spotted dark cream with a striking white mane and tail. The scientists advance the theory in the *Journal of Heredity* (July-Aug.) that this coloration is due to the mutation of a gene which dilutes or modifies a dominantly black pigmentation.

Trot produced a sorrel mare and when this mare was bred to an intensely black stallion, the offspring was the silver dappled stallion Chestnut. All of the popular silver dappled ponies shown in horse shows today are descended from this stallion.

Whenever the dominant modifying gene is coupled with a dominant black gene the result is a silver dappled pony. Other genetic combinations give rise to sorrel ponies with white mane and tail.

Mutant modifiers of black pigmentation are well known in laboratory animals such as rats and mice. The only difference is that in the rodents the modifier is recessive, while in the pony it is dominant.

In both rats and mice, a mutation called pink-eye renders the black pigment so pale that its presence in the eye can be seen only with a microscope.

The geneticists argue that the existence of mutant modifiers in other animals makes their theory that this is the case with silver dappled ponies a reasonable hypothesis.

Science News Letter, November 7, 1953

MEDICINE

Predict Greater Baby Saving Within Five Years

► THE NEXT five years will see a further saving of lives of newborn babies, Dr. William H. Vogt Jr. of Saint Louis University School of Medicine, St. Louis, Mo., predicted at the meeting of the Southern Medical Association in Atlanta, Ga.

Premature babies weighing less than two and three-quarter pounds are now being saved, he said, though formerly that weight was considered the dividing line between babies too small to live and babies big enough to survive.

Of 238 deaths among a total of 16,432 deliveries in the Saint Mary's Group of Hospitals, Saint Louis University, in the last five years, prematurity was listed as the principal cause of death in 135 cases, 49 of which weighed less than two and three-quarter pounds. In the five-year period 1943-1947, 74 deaths of 129 who died, out of 8,989 total deliveries, were attributed to prematurity.

First on the list of improvements in obstetrical care Dr. Vogt suggested was the more frequent use of blood transfusions in caring for the mother, and the infant, but particularly the exchange transfusions of newborn babies with erythroblastosis (Rh blood trouble).

During the five-year period just finished, the number of deaths from erythroblastosis was the same as the five-year period from 1943 to 1947, although the total number of deliveries in the first period considered was only about 60% of the number delivered in the past five years, the obstetrical facilities and the nursery having been expanded to nearly twice its former capacity three years ago.

Dr. Vogt also listed as helping save new babies the use of antibiotics, the development and refinement of surgical procedures designed to correct cardiac and other bodily abnormalities, and better facilities for care of the newborn, particularly the premature, in the nursery.

Science News Letter, November 7, 1953

MEDICINE

Giant Tonsils Hamper Breathing, Swallowing

► A RARE case of tonsils growing so big that they interfered "considerably" with breathing and swallowing was reported by Dr. James T. King of Atlanta, Ga., at the meeting of the Southern Medical Association in Atlanta, Ga.

These giant tonsils grew in the throat of a 67-year-old Negro, who is almost the only patient on record with such a condition. Dr. King could find only one other case in English and American medical literature, and in that case, the condition may have been cancerous, which was not true in Dr. King's patient. He was relieved by having his tonsils removed.

Science News Letter, November 7, 1953

ASTRONOMY

Mercury Crosses Sun's Face

The planet Mercury may be seen as a small, black dot on the face of the sun on Nov. 14, with aid of only a small telescope. This rare event occurs only about 13 times a century.

By ANN EWING

► A TINY, black dot, the planet Mercury, will cross the face of the sun Saturday, Nov. 14. This rare astronomical event, known as a transit, occurs on the average only 13 times in 100 years.

In an astronomical sense, the transit is the same as an eclipse of the sun by the moon. The difference is that the moon is near the earth and, therefore, has an apparent size sufficient to block out the entire light of the sun's disk. Mercury, however, is only 3,100 miles across and it is much farther away, so it will occupy only about one two-hundredths of the sun's visible surface.

For observing purposes, the coming transit of Mercury is the most favorable so far this century, for the United States, since the entire transit can be seen across most of the North American continent.

With clear skies, with proper protection for your eyes and with a low-power telescope, you can see this solar show. Astronomers, both amateur and professional, will be aiming their telescopes at the sun on Nov. 14, noting carefully the time that the entire planet first becomes visible on the sun's face, and also the time it starts to leave.

Relative Sizes Shown

Because Mercury is so small, it is not easy to see against the sun. Dr. Fletcher G. Watson of Harvard University has calculated that during the transit Mercury will appear to have about the same size as that of a penny seen from a quarter of a mile away.

"To see Mercury distinctly when it is in front of the sun," he states, "a magnifying power of at least 100 should be used."

Looking at the sun directly through a telescope would damage your eyes beyond repair. A safe method to view the sun, and a most convenient way to show it to several people at the same time, is simply to attach to the telescope a small frame carrying a screen of white paper or smooth white cardboard at a distance of a foot or more from the eyepiece. In this way, the sun's image can be watched without harm to your eyes, and the principal solar features are quite clear.

Mercury's full sphere will first be visible at about 10:40 a.m. EST, astronomers at the U. S. Naval Observatory in Washington have calculated. Their prediction is made for an observer standing at the earth's center. Since no observer is in such a position,

the actual time that all of the planet first shows against the solar disk will vary across the country by a few seconds.

Just before the full sphere becomes visible, the phenomenon known as the "Black Drop" can be seen. This occurs just before Mercury's full sphere is entirely visible, and it appears as if a dark ligament connects the planet to the sun's edge. Because it is fairly easy to time, astronomers carefully note the second at which this connection seems to break rather than the time of Mercury's first contact with the sun.

14 Transits This Century

The tiny black spot that is Mercury will take just about two and a half hours to cross the face of the sun. At 1:08 p.m. EST, Mercury will first touch the west limb. About four minutes later it will have slipped completely off the sun's face.

Every 116 days this tiny planet, about half again as big as the moon, comes almost between the sun and earth. Since its orbit is tilted seven degrees to the earth's orbital plane, it usually comes either below or above a line joining the earth and the sun, and we do not see it actually in front of the sun except 13 times a century on the average. The 20th century, however, happens to be one in which Mercury transits 14, not 13, times.

The dates on which Mercury can be seen against the sun's disk fall near May 7 and Nov. 9.

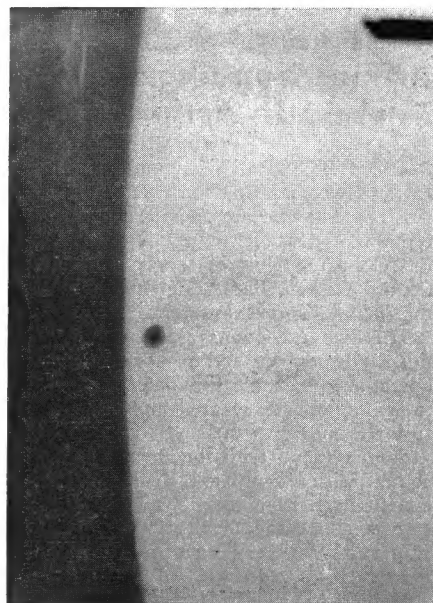
More November Transits

Since at the May transits, Mercury is much closer to the earth than it is ordinarily, the chances of transits taking place are reduced. For the November transits, the planet is nearer the sun, and the chances of transits at this time are about twice as good.

November transits can occur at intervals of 7, 13 and 46 years. May transits, however, can occur only at 13- and 46-year intervals.

Six more transits of Mercury are scheduled during the next 40 years. Its most recent crossing of the sun's face occurred on Nov. 11, 1940. On Nov. 15, 1999, the last transit of the 20th century will take place. Dr. Watson states that this transit may also be the first observed case of a partial transit of Mercury, for at that time, Mercury will skim very close to the sun's edge, grazing it near the northern pole.

Accurate timing of Mercury's transits furnishes scientists with valuable information on irregularities in the earth's rota-



SIC TRANSIT MERCURY—This photograph shows the tiny planet, Mercury, as it first appeared on the sun during its last transit, or crossing, of the sun in 1940. The photograph is reproduced from a frame of a movie made at Mt. Wilson Observatory at that time.

tion. This period is the standard of astronomical time, and Mercury, as well as the moon, can be used as independent timekeepers to check this rate.

Such exact timings were among the first experimental evidences by which Einstein's general theory of relativity was verified. This theory holds that the mass of a body depends upon how fast it is moving. Mercury's orbit, or path, around the sun is quite irregular, and thus its velocity varies from 23 miles a second when it is farthest from the sun to 35 miles per second when it is nearest the sun.

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Small as this difference is, it is sufficient, according to the relativity theory, to change the effective mass of Mercury and thus account for what had previously been a discrepancy between the observed times of its transits and the predicted times.

The planet Mercury has been known for thousands of years, the first recorded observations of it having been made in 264 B.C. Mercury is so near the sun that it is comparatively seldom seen as a "star" with the naked eye. In March and April, however, it is easily visible as a brilliant object low down in the twilight; and in September or October, it can be best seen as a morning star.

The best astronomical evidence now available is that Mercury, like the moon, is completely without air, any that it may have had having escaped into space long ago. Although Mercury has no atmosphere to hide its surface, only a few vague markings have been detected, and there are considerable differences between the descriptions of the various observers.

An Exceptional Planet

Mercury is an exceptional planet in many ways. It is the closest to the sun, the distance ranging all the way from 28,600,000 to 43,400,000 miles. Its velocity of from 23 to 35 miles a second is the swiftest of any planet. From this planet, the sun would look four and one-half times larger than it does from the earth.

Mercury's distance from the earth ranges from about 50,000,000 miles to about 136,000,000 miles. Of all the planets, it receives the most light and heat from the sun, a given area of its surface receiving on the average nearly seven times as much as the same area on earth. However, it keeps the same face always toward the sun, just as the moon does toward the earth.

The temperature of the sunlit side has been estimated to be about 350 degrees Centigrade, or about 660 degrees Fahrenheit. At this temperature, tin would melt. The opposite face, which never receives any sunlight, is believed to be intensely cold. Between these two faces is a region in which the sun alternately rises above the horizon and drops back again, thus causing extreme variations of temperatures.

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For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

BIBLIOGRAPHY AND INDEX OF GEOLOGY EXCLUSIVE OF NORTH AMERICA: Vol. 17 — Marie Siegrist, Mary C. Grier, and Marcia Lakeman—*Geological Society of America*, 621 p., \$5.75. This volume covers South America, Europe, Asia, Africa, Australia, Iceland and ocean islands. It includes references to material published during 1952 and older material not previously cited.

ELECTRICITY AND MAGNETISM—Edson Ruther Peck—*McGraw-Hill*, 476 p., illus., \$7.50. For the advanced undergraduate student with a background of general physics and calculus.

GOURMET COOKING FOR CARDIAC DIETS—Florence Field—*World Publishing Company*, 350 p., illus., \$3.50. Help in planning daily menus and in cooking special dishes that will provide food with zest and palatability, not only for the patient but for the whole family.

HIGHER TRANSCENDENTAL FUNCTIONS: Volume II—Based in part on notes left by Harry Bateman and compiled by the Staff of the Bateman Manuscript Project—*McGraw-Hill*, 396 p., \$7.50. A reference work on advanced mathe-

matics prepared at California Institute of Technology under contract with the Office of Naval Research.

INTERRELATIONS BETWEEN THE SOCIAL ENVIRONMENT AND PSYCHIATRIC DISORDERS: Papers Presented at the 1952 Annual Conference of the Milbank Memorial Fund—*Milbank Memorial Fund*, 265 p., paper, \$1.50. Discussion by leaders in various fields of the many factors in the cultural as well as physical environment which affect mental health or illness.

J. ROBERT OPPENHEIMER AND THE ATOMIC STORY—J. Alvin Kugelmann—*Messner*, 179 p., illus., \$2.75. The story of the life of one of the men most intimately connected with the development of the atomic bomb.

JOHNNY GOES TO THE HOSPITAL — Josephine Abbott Sever—*Houghton Mifflin*, 32 p., illus., paper, \$1.00. A book for parents to read to a child who faces a trip to the hospital. Prepared under the direction of a physician.

LABORATORY EXPERIMENTS WITH RADIOISOTOPES FOR HIGH SCHOOL SCIENCE DEMONSTRATIONS—Samuel Schenberg, Ed.—*Govt. Printing Office*, 53 p., illus., paper, 25 cents. Prepared for science teachers under the auspices of the Atomic Energy Commission.

THE MAMMALS OF MINNESOTA — Harvey L. Gunderson and James R. Beer — *University of Minnesota Press*, 190 p., illus., \$3.50. Not intended as a complete treatise, this book is for use by schools and laymen interested in animals.

MENTAL HEALTH IMPLICATIONS IN CIVILIAN EMERGENCIES—Subcommittee on Civil Defense, National Advisory Mental Health Council — *Govt. Printing Office*, 25 p., paper, 15 cents. There is no wonder drug which can be swallowed or taken by injection to insure against panic and emotional breakdown, but nevertheless there is much that can be done to care for mental health.

MIRROR OF FLOWERS—Dorothea Eastwood—*Houghton Mifflin*, 237 p., illus., \$3.50. For the flower lover who has no ambition to become a botanist.

THE OUTLOOK FOR WOMEN IN PROFESSIONAL NURSING OCCUPATIONS—*Govt. Printing Office*,

80 p., illus., paper, 30 cents. Evaluating the nursing profession as a career for young women.

THE PHYSIOPATHOLOGY OF CANCER: A Treatise for Investigators, Physicians, and Students — Freddy Homburger and William H. Fishman, Eds., *Hoebner-Harper*, 1031 p., illus., \$18.00. No one individual, no one discipline, can hope for the mastery of a complex problem like that of cancer. This book attempts the comparison and coordination of information from various fields. Contributed by 28 specialists.

RAROA: Happy Island of the South Seas — Bengt Danielsson, translated from the Swedish by F. H. Lyon—*Rand McNally*, 304 p., illus., \$4.50. Readers of Kon-Tiki will remember the author of this book as the tall, bearded Swede who was one of the crew. Interested in the little island where the raft crashed, Bengt Danielsson, an anthropologist, returned for a year's study.

STUDIES ON CHROMOSOMES AND NUCLEAR DIVISION: Transactions of the American Philosophical Society, New Series, Volume 43, Part 3, 1953—L. R. Cleveland—*American Philosophical Society*, 60 p., illus., paper, \$1.50. Reporting research on chromosome behavior, aided by a grant from the American Cancer Society.

THE WEB OF LIFE: A First Book of Ecology — John H. Storer—*Devin-Adair*, 144 p., illus., \$3.00. All living things, Fairfield Osborn says in an introduction, are related to each other. This book is a study of the many interrelationships. Of particular interest to agricultural students.

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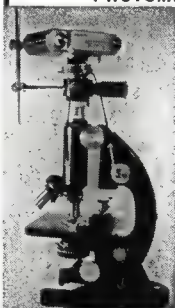
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You know the one who would thank you again and again for such a gift. And if you are not yourself a member, you could hint to someone that you'd like it as a gift yourself.

The 1954 THINGS of science will be unusual; every month's package will be a surprise. A Christmas Membership to THINGS of science will bring the 12 units of 1954, plus an extra unit which we will select and add to your gift with our compliments. We will make out and mail a Christmas card with your name as donor, announcing your gift. Each membership is \$5 a year, postpaid. You will find a handy order coupon below.

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Three books



These three fellows of ours are smiling for the photographer in celebration of the publication of their book, "Principles of Color Photography." In the book they don't smile at all. Soberly and with an abundance of illustrations, Messrs. Ralph M. Evans, W. T. Hanson, Jr., and W. Lyle Brewer (pictured r. to l. in that order) present the theory behind visual and photographic sensitometry, analyze the methods of obtaining colorant images, and tell how they are combined to give color processes. It's sold by Kodak dealers for \$11, and no inventor of new systems of color photography should be without a copy.

No user, or prospective user, of the photographic emulsion as a scientific instrumentality should be without a copy of "Kodak Photographic Plates for Scientific and Technical Use." Besides giving the detailed information implied by the title, it contains just about the most concise précis of the scientific theory of photography to be found. The new edition has been extensively revised. Kodak dealers sell it for 50¢.

Still lower on the price scale, namely free, is another newly revised booklet, "Kodak Materials and Accessories for Industrial Radiography." This one tells how to pick the best type of film for any non-medical job involving exposure to x-rays and describes various devices to make life more pleasant in the x-ray laboratory. You can get a copy by writing Eastman Kodak Company, X-ray Division, Rochester 4, N. Y.

Fine needles, fine haystack . . .

Why is *o*-Benzoic Sulfimide (Eastman 38) like 2-Aminobenzothiazole (Eastman 3940)?

One of our senior chemists, who knows the Eastman catalog about as well as he knows his children's names and ages, got to brooding recently that given one of these compounds, even *he* wouldn't have been able to name the other right off as one of its nearest relatives in our list. (Both consist of a C₃NS heterocycle fused to a carbocycle.) His unease about the difficulty in picking up such relationships among his own merchandise pricked him to spend a good many hours at home making up a deck of cards coded for each compound, that could be shuffled in various ways.

We now learn that another chemist, who works not for us but for Remington Rand, has done the job by punched cards. We ourselves have encoded a fair amount of chemical data on punched cards, but this chemist has done it by the new Wiswesser notation for every Eastman Organic Chemical having a known structure. Thus electromechanical brains, such as are ensconced in many large organizations, can fill in their idle moments by discovering all sorts of important relationships among the more than 3500 organic compounds available from a single, completely dependable source—namely, us.

If you want to know more about what this man has done, or if you want to purchase our catalog in punched card form, write Remington Rand Inc., 315 Fourth Avenue, New York 10, N. Y. In its conventional book form, the catalog remains free of charge. If you need a copy, write to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).



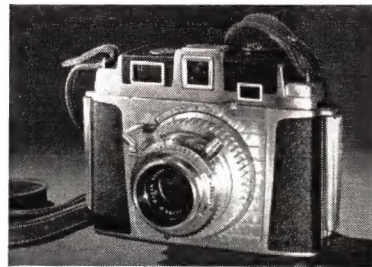
The Chevron

The world's best known camera manufacturer has just announced its finest roll-film camera. While not surprising, this is nevertheless news.

The camera provides the size advantage of 2¼" x 2¼" negatives or

color transparencies, yet is used at the eye-level position preferred by many. It has the world's fastest between-the-lens shutter, with rotating blades for smoother, more accurate exposure. There are ten speeds from 1/800 second to one second, plus "B." Flash synchronization is continuously adjustable for top efficiency at all shutter speeds with both Class F and Class M flash bulbs and electronic flash equipment like the Kodatron Speed-lamp.

The lens is a 78mm f/3.5 Kodak Ektar Lens—a finer one we doubt you can buy. To provide the focusing accuracy such a lens merits, there is a split-field rangefinder operating from 3½ feet to infinity and based on such advanced design features as double V-bearings for moving its mirror, ball-bearing mount-



ing for the focusing tube, and cams almost eight inches long machined to accuracy within .0005" throughout their length. The rangefinding operation automatically applies the proper parallax correction to the adjacent viewfinder. An adapter is available to take No. 828 film for the larger 28 x 40 mm Kodachrome slides. Weight: 2½ pounds. Price: no fortune but a sensible \$215 for a piece of equipment of strictly professional calibre. (Worth keeping in mind, for example, as a retirement gift for someone who respects noble instrumentation.)

Superlatives in print tire the eyes. If you want to see a well-built camera, go down to your Kodak dealer and ask him to show you the Kodak Chevron Camera. Since quantities are still limited, there may be a little wait for delivery.

Prices include Federal Tax where applicable and are subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . serving laboratories everywhere

Kodak
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MAMMALOGY

NATURE
RAMBLINGS

Proximity Sensings

► BATS WERE the original discoverers of the principle of the proximity fuze.

These flying mammals have long excited man's wonder at their ability to fly about in the near-darkness of caves, or outdoors in the deepening dusk, without ever colliding with the walls or with each other. Small wonder that our ancestors were inclined to look upon them as endowed with darkly supernatural powers—even to the extent of picturing Satan as having bat's wings!

Modern scientists, insatiably curious and unafraid of the Devil himself, have done some rather extensive experimenting on this uncanny ability of bats to sense their way around in the dark. They have tried putting up obstacles that must be as difficult for bats to see as for human beings, things like stretched wires and suspended strings—and the bats would avoid these as readily as they did larger and more obvious lumps of matter.

Finally the secret was hit upon. Bats, it was discovered, constantly give out exceedingly shrill little chirpings while in flight. Probably the chirps that we hear are the lowest-pitched on the bat's tones, at that—higher notes that they pipe are above the human ear's perceptive ability.

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Echoes of these high-pitched notes, returned to the bat's ears by the surfaces of obstacles, warn of impending collisions, and the bat's exquisitely-balanced neuro-muscular flight controls automatically go into action and cause a saving zoom or swerve.

Now this is essentially what the proximity fuze does, except that in its case the echo-producing vibrations are those of ultra-short radio waves in the ether instead of ultra-short sound waves in the air. But the principle is the same—an apparatus that sends out exploratory vibrations and catches their returning echoes. Of course, the resultant behavior is different: the bat swerves, the bomb blows up.

Now it has been proposed to make the avoidance independent of human eyes on the instrument board and hands on the controls—to turn the plane into a kind of mechanical super-bat.

Science News Letter, November 7, 1953

Questions

ASTRONOMY—How many times in a century does Mercury transit, on the average? p. 298.

□ □ □

GENETICS—Why are some scientists interested in Shetland ponies? p. 297.

□ □ □

MEDICINE—What drugs are considered best for treating children's infections? p. 292.

For how many deaths in the United States each year is asthma responsible? p. 295?

□ □ □

METEOROLOGY — How will withdrawal of U. S. ships from Atlantic weather chain affect long-range forecasts? p. 294.

□ □ □

NUTRITION—How do ready-to-serve meals compare in cost with entirely home-prepared ones? p. 296.

□ □ □

VOLCANOLOGY — How many active volcanoes are there in the world? p. 296.

□ □ □

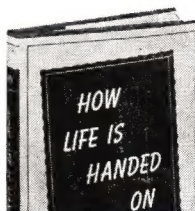
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• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 699. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **ANTI-RUST PAINT**, now available in small quantities for boat owners, is specially designed to preserve iron and steel against the deteriorating effects of salt or fresh water and atmospheric conditions. Battleship gray in color, the paint can be used as a primer coat or finished coat. It dries tack-free in an hour.

Science News Letter, November 7, 1953

⚙️ **POCKET DRAWING** instrument is designed to save time for persons who must make mechanical drawings. It combines the functions of T-squares, triangles, straight-edges, scales and protractors. The instrument is 10.5 inches long, 3.5 inches wide and weighs four ounces. A professional desk model can be obtained with an engineer's scale substituted for the standard architect's scale.

Science News Letter, November 7, 1953

⚙️ **BEVERAGE CARRIER** is a 31-inch-long tube with an inside diameter of 3¼ inches. Made of molded plastic and glass fiber cloth, the carrier accommodates six cans or four soft-drink bottles in a special tray, keeping the contents cold for hours.

Science News Letter, November 7, 1953

⚙️ **DUSTING MITT** has a built-in supply of medicated powder compounded to rid dogs and cats of fleas, ticks and parasites.



The user dons the mitt and gently pats the animal with it, as shown in the photograph. Nontoxic powder sifts into the pet's coat quickly.

Science News Letter, November 7, 1953

⚙️ **"TENSION" SCREW** driver features a spring-like leaf that fits into the screw's slot along with the screw driver blade, holding the screw securely. Working even on

countersunk screws, the screw driver is designed to permit the user to get at those hard-to-reach places.

Science News Letter, November 7, 1953

⚙️ **TRIM FOR** casement windows provides a complete inside-outside finish that is said to work with all types of construction. The trim can be installed quickly with hammer and nails, and comes with a factory baked-on coat of rust-resisting primer paint.

Science News Letter, November 7, 1953

⚙️ **MECHANICAL MONKEY** is designed to coax children to hang up their shirts, pajamas and coats. Attached to a wall or closet door, the mechanical monkey scowls unhappily when its clothes hook is empty. But when clothes are placed on the hook, the monkey's eyebrows and mouth break into a friendly grin.

Science News Letter, November 7, 1953

⚙️ **"SNOOP-PROOF" SAFE** features a combination-lock dial readable only from the side by one person, thus foiling possible snoopers who learn combinations on the sly by watching over the safe-opener's shoulders. The safe also is equipped with a new type of "day gate" that keeps unauthorized persons out during banking hours when the big steel doors are swung wide.

Science News Letter, November 7, 1953

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Do You Know?

A four-year study revealed that cows kept in comfort stalls produced more milk than those kept in tie-chain stalls; the comfort stall is larger than the latter.

Thunderstorms often appear to come up against the wind because they create great up-drafts of air that "suck" ground breezes toward the cloud from all directions.

Commercial potato washing is relatively new in Maine, although it is commonly accepted in several potato producing areas in the U. S.

In the U. S., about 50% of the refined copper produced in an average year is drawn into wire.

Short periods of a poor diet can produce damage in young persons that does not show up until they are much older.

There are more than 200 different types of inks.